 <p style="text-align: center;">CREDIT VALLEY THE CREDIT VALLEY HOSPITAL</p>	CLINICAL PRACTICE GUIDELINE	PROFESSIONAL PRACTICE
TITLE: Management of Thrombolytic Induced Major Bleeding		
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SUPERCEDES: New	ISSUED BY: _____ TITLE: Chief of Medical Staff	
	ISSUED BY: _____ TITLE: President	

Purpose:

To provide a guideline to assist physicians in the management of patients with thrombolytic induced major bleeding.

Selection Criteria:

Inclusion

- patients with major bleeding following treatment with a thrombolytic eg TPA, TNK, streptokinase

Definition of major bleeding: decrease in Hg of ≥ 30 g/L, retroperitoneal bleed, intra-cranial hemorrhage, intraocular bleed.

Diagnostic Workup

Depending on the site of bleeding, imaging studies such as abdominal ultrasound (for retroperitoneal bleeds) or head CT scans may be needed to confirm the diagnosis. **For intra-cranial hemorrhage (ICH), if radiologic confirmation will take greater than one hour, start treatment immediately.**

Initial blood work should include CBC, INR, PTT and thrombin time. If the patient continues to bleed, further testing for fibrinogen and bleeding time may be required.

Treatment

See Appendix 1 - Management of Thrombolytic Induced Major Bleeding

See Appendix 2 - Management of Thrombolytic Induced Intra-cranial Hemorrhage

When a CNS or other potentially fatal hemorrhage occurs, all available options must be used concurrently, in the hope of avoiding a fatal outcome, or a permanent serious neurologic deficit.

Risks of Treatment (2):

Potential complications of blood product administration must be taken into account:

- coronary re-occlusion can occur with or related to (coagulation factors, platelets, aminocaproic acid (Amicar)*)
- volume overload (packed RBCs, FFPs)
- transmission of infectious agents
- increased bleeding (FFPs)

*Aminocaproic acid (Amicar) should only be used in potentially fatal hemorrhage situations (uncontrollable hemorrhage with potential exsanguination, intra-cranial hemorrhage), which occurs shortly after administration of thrombolytic agents. Initial dosage is 5 g/250 mL D5W or NS over 1 h followed by 5 g/250 mL D5W or NS, 50 mL/h x 5 hours or until bleeding ceases.(2,3)

Responsibilities:

Physicians

All physicians involved in the care of patients receiving thrombolytic therapy should be aware of the management guidelines. These guidelines will be posted in ER, ICU, CCU and 3B.

Evaluation

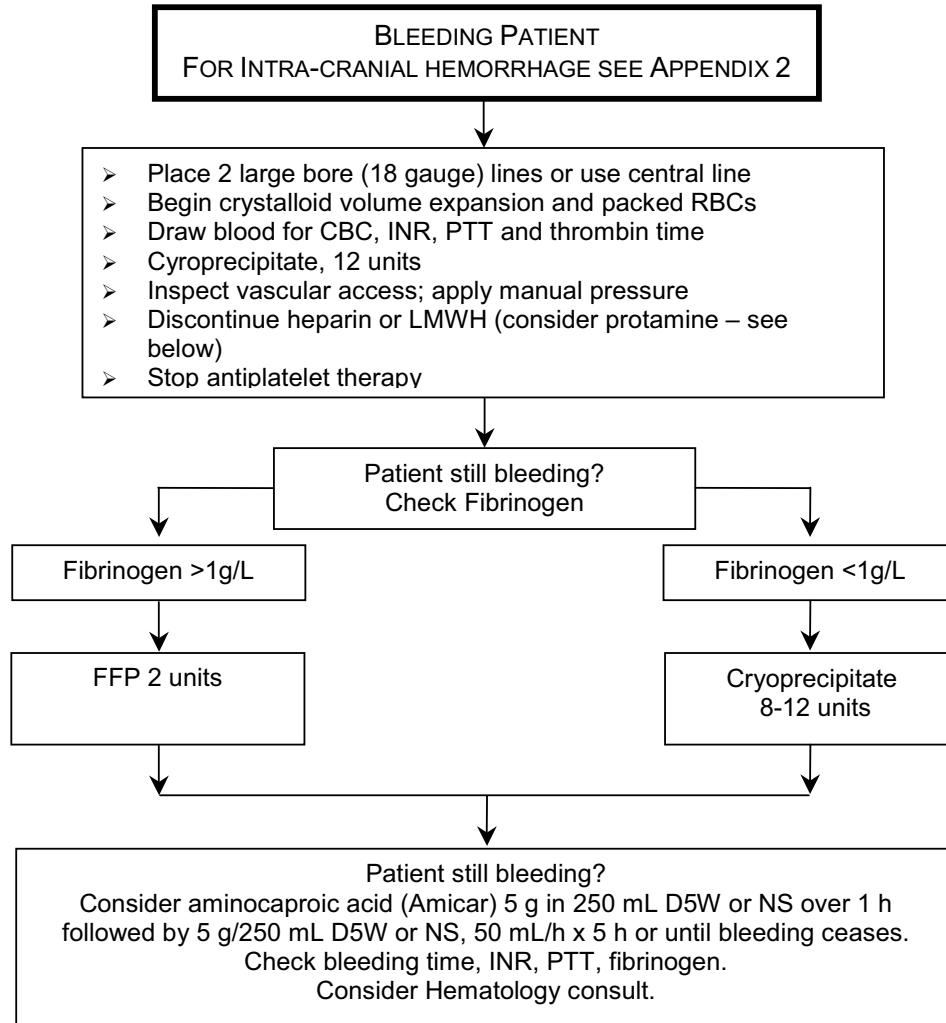
References:

1. Sunnybrook Health Science Centre Formulary, Sept 1996.
2. Garner M. Thrombolysis induced bleeding treatment. CAEP/AMUQ Joint Conference, 1999: 257-265.
3. Aminocaproic Acid, Drug Evaluation Monograph, Micromedex 2001.

Approval:

Cardiology Steering Committee: Nov 2001
Emergency Steering Committee: Nov 2001
Professional Practice Committee: Dec 2001
Clinical Quality Care Committee: Dec 2001
Medical Advisory Committee: Jan 2002

Management of Thrombolytic Induced Major Bleeding



PROTAMINE ADMINISTRATION:

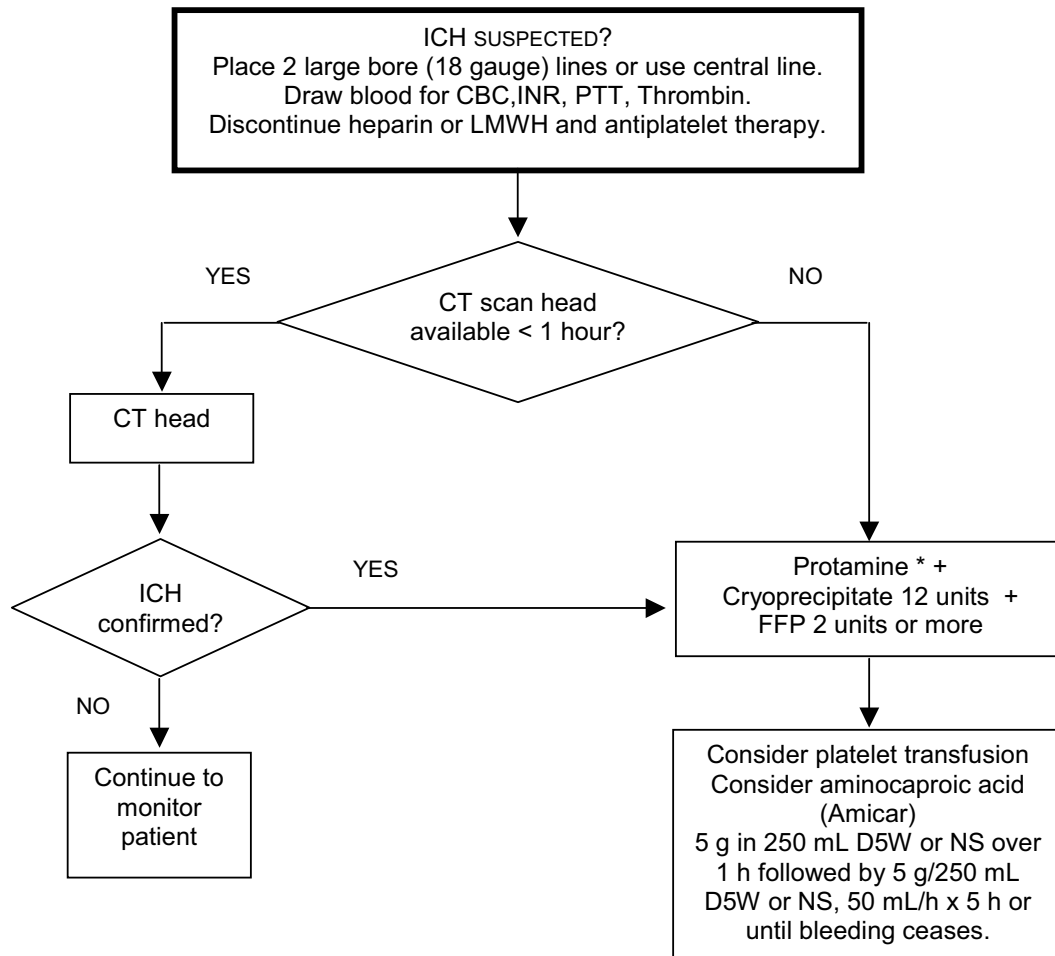
- In cases of hemorrhage that are severe enough to warrant reversal of anticoagulation, a slow IV infusion of protamine sulfate may be used
- **Too rapid an injection or too large a dose of protamine may cause hypotension or anaphylactoid-like reactions. Facilities to treat shock should be readily available**
- Patients who have previously received protamine (eg diabetic patients taking NPH insulin which contains protamine) have a 1% risk of anaphylaxis

REVERSAL OF LMWH

- In all cases, anti-factor Xa activity is incompletely neutralized (maximum about 60%)
- 1 mg of protamine will help neutralize 1 mg of enoxaparin; ie the dose of protamine is equal to the dose of enoxaparin
- A second infusion of 0.5 mg protamine per 1 mg enoxaparin may be administered if hemorrhaging continues
- The time elapsed since the last enoxaparin dose has been given is important to the calculation of the protamine dose required for neutralizations:
 - Dose within last 8 h: 1 mg of protamine per 1 mg of enoxaparin
 - Dose more than 8 h: 0.5 mg of protamine per 1 mg of enoxaparin
 - Dose more than 12 h: protamine may not be required

REVERSAL OF HEPARIN

- Obtain a PTT and calculate approximate amount of heparin in circulation (assuming half life of 60 min and 1500 u/h of heparin = 2200 units of heparin on board)
- Infuse 10 mg protamine in 50 mL NS IV over 10 minutes followed by 10-20 mg protamine in 50 mL NS IV over 10-20 minutes (this will neutralize 2,000-3,000 units of heparin)
- Obtain a PTT post protamine infusion to document heparin reversal

Management of Thrombolytic Induced Intra-cranial Hemorrhage (ICH)

* PROTAMINE

Infuse 10 mg protamine in 50 mL NS IV over 10 minutes followed by

10-20 mg protamine in 50 mL NS IV over 10-20 minutes (this will neutralize 2,000-3,000 units of heparin)